U.S. Environmental Protection Agency
Regional Oversight Contract Zone 3

Contract No. 68-W6-0063
DCN: RZ3-TLI-07ZZ-04-TR-1400

FEDERAL FACILITY PRELIMINARY ASSESSMENT

GATEWAY (EX) ARMY AMMUNITION PLAN
ST. LOUIS COUNTY, MISSOURI

September 28, 2001

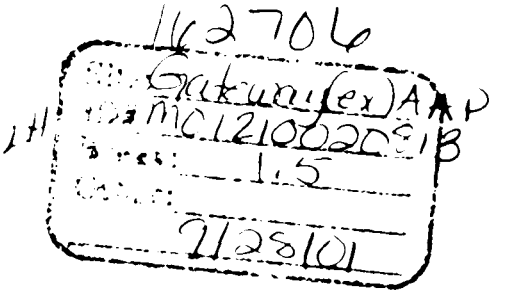

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TABLE OF CONTENTS

FIGURES

TABLES

ACRONYM LIST

bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
Chrysler	Chrysler Corporation
DoA	Department of Army
DoD	United States Department of Defense
°F	Fahrenheit (degrees)
GAAP	Gateway (Ex) Army Ammunition Plant
GIQS	Geographic Information Query System
GOCO	Government Owned-Contractor Operated
HRS	Hazardous Ranking System
IA	Installation Assessment
MDNR	Missouri Department of Natural Resources
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
SARA	Superfund Amendments and Reauthorization Act
TDL	Target Distance Limit
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
USATHMA	United States Army Toxic and Hazardous Materials Agency

1.0 INTRODUCTION

A Federal Facility Preliminary Assessment (PA) Review was performed by TechLaw, Inc., for the Gateway (Ex) Army Ammunition Plant (GAAP) located in St. Louis, St. Louis County, Missouri. This PA was conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reathuorization Act (SARA) of 1986. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification number for the site is MO1210020813.

The purpose of this PA review was to collect sufficient information on site conditions to evaluate and assess potential source(s) of contamination, evaluate immediate and potential threats to human health and the environment, and to support a decision regarding the need for further action under CERCLA/SARA. Primary activities included research and review of existing federal and state file information, and a comprehensive target search.

2.0 SITE DESCRIPTION

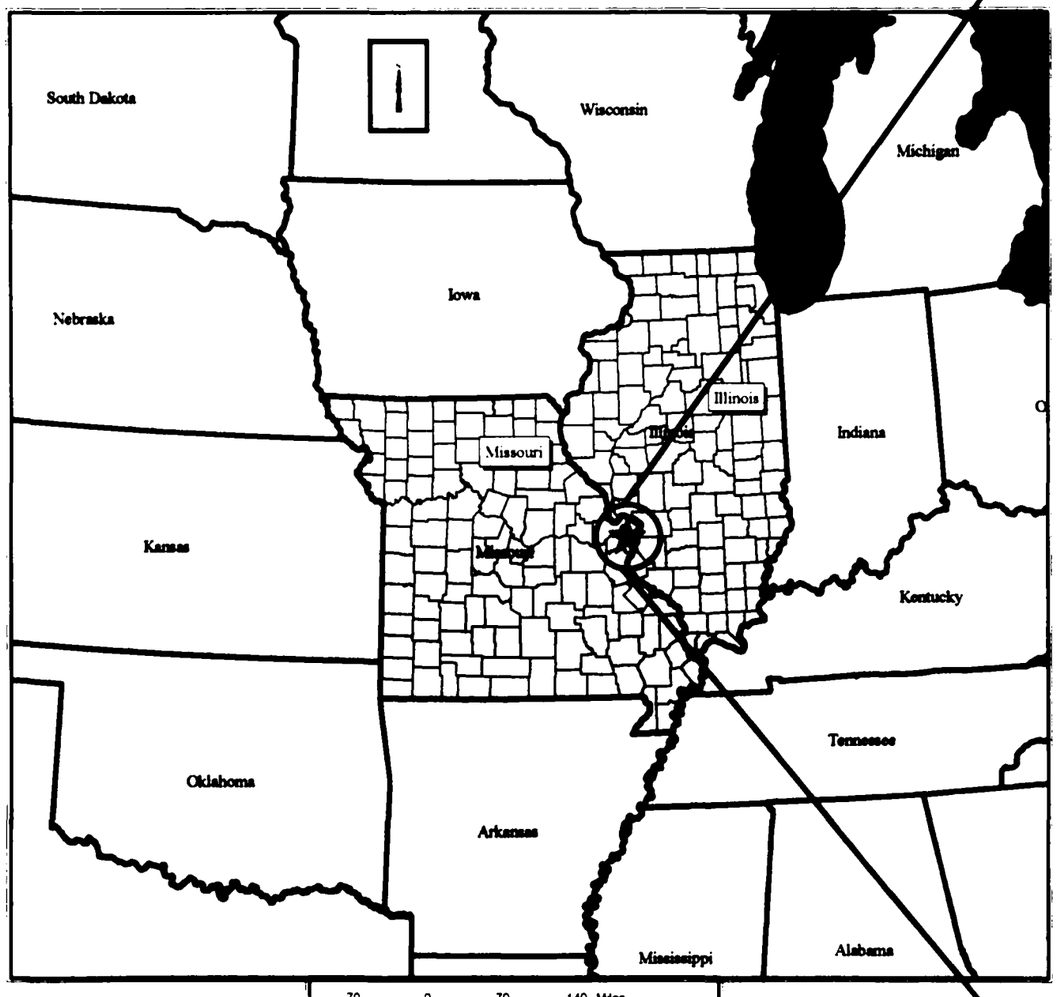
The site is located at 6703 Southwest Avenue in St. Louis, St. Louis County, Missouri (Figure 1). The approximate geographic coordinates of the site are 38° 36' 16.52" North Latitude and 90° 18' 42.18" West Longitude. Situated in the southern section of St. Louis, the site occupies approximately 15 acres of land and is divided into two separate parcels. These parcels are separated by the River Des Peres (Figure 2).

A parcel of the site that encompasses approximately 12 acres is located south/southeast of the River Des Peres. It is bounded to the south by the St. Louis and San Francisco Railway (train tracks), on the north/northwest by the River Des Peres, on the east by the Scullin Steel Company property, and on the west by Southwest Avenue.

The second parcel covers approximately three acres. It is situated north of the River Des Peres right-of-way and bounded by Southwest Avenue to the south. The Scullin Steel Company property is located to the north, the River Des Peres is located to the east, and Ecoff Avenue to the west of this parcel (Figure 2).

Figure 1
Site Location Map

Gateway (ex) Army Ammunition Plant
CERCLIS Number MO1210020813



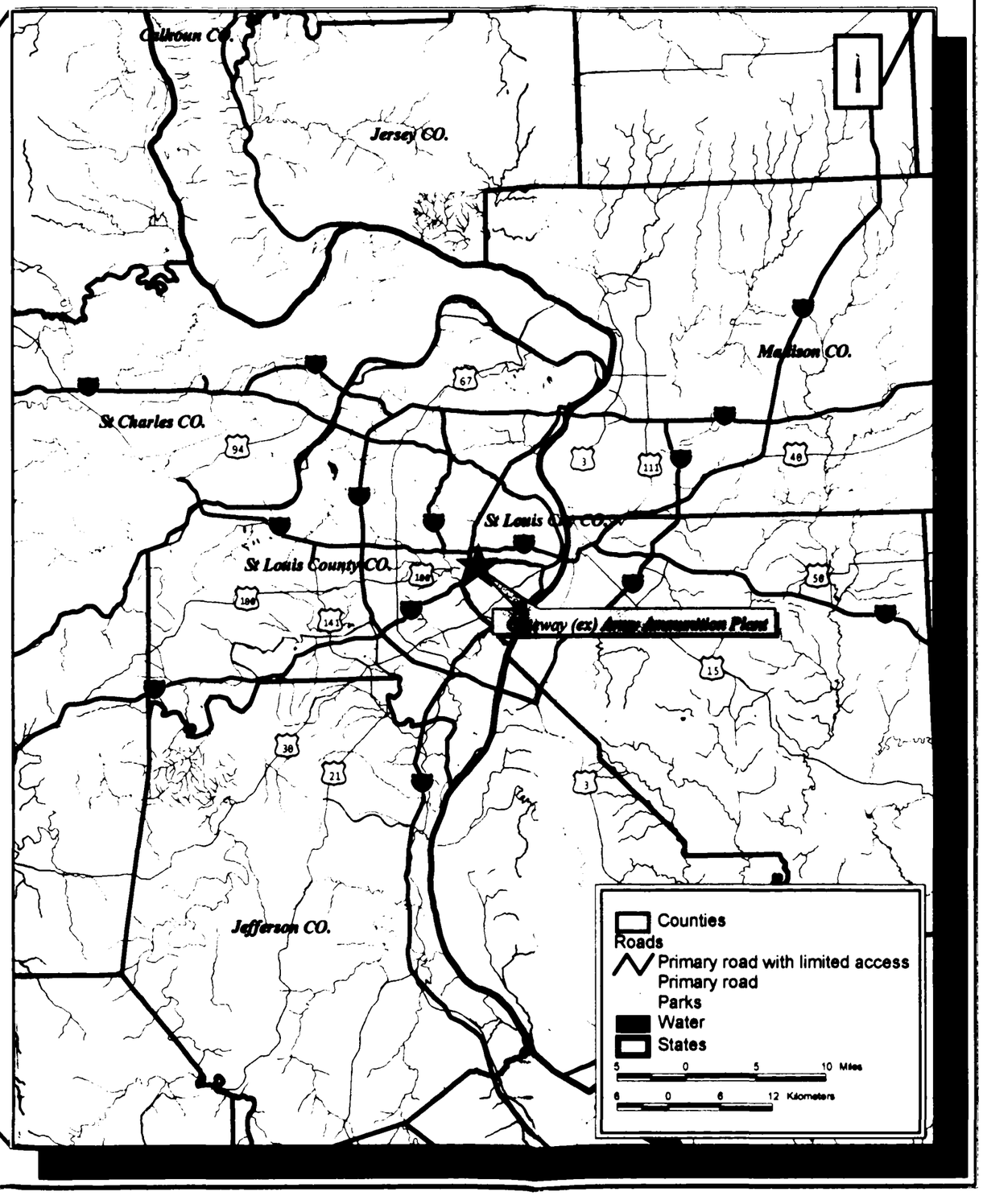


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Figure 2
Site Map

Gateway (ex) Army Ammunition Plant
CERCLIS Number MO1210020813

Note
Aerial Photograph date is January 28, 1994

100 0 100 200 Feet
30 0 30 60 Meters

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The climate in St. Louis County consists of cold winters and long, hot summers. Heavy rain events occur mainly in Spring and early Summer. The average temperature in the Winter is 33 degrees Fahrenheit (°F). The average Summer temperature is 77 degrees °F. The total annual precipitation is approximately 33.8 inches. The average relative humidity is about 60 percent (USDA, 1982).

3.0 OPERATION HISTORY AND WASTE CHARACTERISTICS

The land for the site was acquired in 1942 by the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation. A plant was designed and constructed by Scullin Steel Company and financed by the U.S. Government. Originally the plant consisted of approximately 35 buildings, structures, and tanks, among others, together with machinery and equipment, designed as a separate and complete plant for production of heavy armor casting for the Maritime Commission. During peak production, the plant employed approximately 2,000 personnel consisting primarily of pattern makers, smelters, core makers, x-ray personnel, and general laborers. Waste from this production consisted of lubricating and quenching oils (containing sulfur and molybdenum disulfide) and metallic cutting chips. The projectiles were washed, rinsed, and dipped in several treatment solutions in preparation for painting. Wastes from this area included alkalis (cleaners), zinc phosphate, chromates (tri- and hexavalent), and oil-based paints (USATHMA, 1979). Production ceased after World War II in 1947 and the plant was declared surplus and placed in the National Reserve. The property was reactivated later during the Korean War. In 1950, the site was renamed the St. Louis Army Steel Foundry. The plant was temporarily made available to the Department of Army (DoA) for production of armor castings for tanks. Operated by Scullin Steel Company, the plant then provided the Ordnance Corps of the Army with armor casting support (USATHMA, 1979). This support continued from 1950 to 1954. In 1954, the plant was deactivated for the second time.

Permanent control and jurisdiction of the site was transferred by the General Services Administration to DoA in March 1953. The onsite plant operated until September 1954 and was placed in lay away status. The plant was in an inactive status from 1955 to 1967. From 1955 to 1962 the inactive plant was contracted to Universal Marion Corporation (a Scullin Steel Division) for production of tank hulls and turrets in the event of military mobilization. The facility was leased in 1962 to Universal Marion Corporation for commercial purposes. This commercial venture failed and the plant remained

idle until 1966. In October 1966, the U.S. Government retained the facility to produce 8-inch and M106 shells, and 175-millimeter (mm) projectiles. The projectiles were reportedly washed, rinsed, and dipped in several treatment solutions in preparation for painting. Wastes from this area included alkalis (cleaners), zinc phosphate, tri- and hexavalent chromates, and oil-based paints (USATHMA, 1979). On April 17, 1967, the site was placed in an active status and designated the Gateway Army Ammunition Plant.

The Space Division of the Chrysler Corporation (Chrysler) was designated as the Government Owned-Contractor Operated (GOCO) operator (USATHMA, 1979). Pending a decision on the future status of the plant, Chrysler was authorized by the U.S. Government to perform surveillance and interim maintenance on the facility. Chrysler completed the interim maintenance work on April 30, 1971 (USATHMA, 1979).

In November 1970, DoA decided to place the facility in lay away status and prepare it for long-term storage, although in a high state of readiness. This action was due to the reduction in 175-mm production requirements in Southeast Asia. In April 1971 fixed price contracts were awarded to Voss Machinery Company for the following: lay away of production facilities; power de-energized, maintenance and surveillance of inactive facilities; and gathering of data and reports. No specific information was available to indicate the frequency of data collection or the generation of reports. GAAP has remained inactive and Voss Machinery Company has remained the maintenance and surveillance contractor to date (USATHMA, 1979).

The GAAP facility manufactured heavy armor and miscellaneous alloy steel castings (anchors, chains, among others) during the last two years of World War II. Site operations were closed in 1945 and reopened in 1950 for four years when turrets for the M-47 and M-48 tanks were manufactured. In addition, GAAP was a metal foundry that conducted operations common to that industry during the these two production periods. Four open hearth furnaces supplied necessary molten steel for casting, while the sand plant, drying ovens, and pattern shop completed the manufacturing processes. Other support facilities at the site included: 44 heat-treating furnaces, a machine shop, an oil-storage tank farm, several shot blast scale removal machines, and a power house (Building 32) for supplying steam. In addition, a laboratory, located in Building 20, was used for quality control purposes, while

an X-ray area contained three inspection machines (Building 11) and a two million-pound chain and anchor testing machine. Characteristics of waste materials from these operations would be classified as industrial. Waste materials included sand and scale from cleaning operations, slag from the open hearth furnaces, ash from the power house, excess metal from molds, rejected items, metal chips, and oils from the machine shop, quenching, and hydraulic press areas (USATHMA, 1979).

In 1967 and 1968 modifications were made to the foundry in anticipation of future 8-inch shell production; however, this production did not materialize. During this time, modifications were also made for the production of 175-mm projectiles. The 175-mm projectiles were manufactured at the site from December 1968 through September 1970. Waste from this production consisted of lubricating and quenching oils (containing sulfur and molybdenum disulfide) and metallic cutting chips. The projectiles were washed, rinsed, and dipped in several treatment solutions in preparation for painting. Wastes from this area included alkalis (cleaners), zinc phosphate, chromates (tri- and hexavalent), and oil-based paints (USATHMA, 1979).

During the time when the foundry was modified for the production of 175-mm projectiles, a small waste treatment plant was installed through which all industrial wastewater was to be processed. The treatment plant was completed in January 1969. In February 1969 GOCO protested to the U.S. Government stating that the treatment plant could not be operated properly without design changes. Modifications were made in April 1970, however, the waste treatment plant was in use for only five months. During modifications to the plant, the industrial wastewater was collected in an underground concrete tank located beneath the floor of the treatment plant. No additional information regarding the size and condition of the concrete tank was available. The modified treatment plant handled daily wastes and some periodic dumps of oily wastes. These wastes were neutralized by the addition of sulfuric acid, lime, coagulation chemicals (e.g., ferrous sulfate, aluminum sulfate, or ferric chloride), and activated silica to enhance the floatation of suspended materials. Occasionally, a chromium solution, (which is a reducing agent) such as sodium meta-bisulfite or ferrous sulfate, was added (one to two times a year; less than 18,950 liters per dump) to reduce hexavalent chromium to the trivalent state. The effluent was directed to the sanitary sewer when the pH was less than 10; if the pH was greater than 10, then the effluent was directed toward the River Des Peres storm channel (USATHMA, 1979).

In the late 1950s, Building 31 was leased to Perceptual Development Laboratory for a 15-year period. Details regarding this operation were not available during the review. Vulcan Manufacturing Company leased two buildings (Buildings 31 and 62) and adjacent parking lots in the southwest section of the site between 1975 and 1980. A 50-year water line easement with the Union Electric Company was initiated in April 1977. This easement includes approximately 0.3 acres (USATHMA, 1979).

4.0 PAST REGULATORY ACTIVITIES

The following information pertaining to previous investigations was obtained primarily from documents available at the Untied States Environmental Protection Agency (USEPA) Region 7 Information Resource Center. Only past assessment activities of significance to future CERCLA/SARA actions onsite are discussed in this section.

An Installation Assessment (IA) Report for the site was prepared by the United States Army Toxic and Hazardous Materials Agency (USATHMA) in 1979. The investigative findings from the IA are detailed in Section 2.2 of the IA Report. No samples were collected during the IA (USATHMA, 1979).

A. H. Environment, Inc., completed the Decontamination Operations Report at the site in November 1983. In support of the Decontamination Operations Report, asbestos repair and removal were conducted at the site. Areas of damaged insulation in the facility buildings were repaired and peeling paint, with a lead content in excess of 0.06 percent (by weight), was removed from painted surfaces and disposed. In addition, waste and debris from an equipment pit (Nosing Press Pit) in the main manufacturing building, a bermed area behind the main manufacturing building, and seven electrical transformers documented to contain Polychlorinated Biphenyls (PCBs) were removed from the area. However, no surface or subsurface samples were collected to confirm the presence or absence of contamination at the site (AHE, 1983).

The site was identified by USEPA in 1984 and was determined to have been used previously by the United States Department of Defense (DoD). No other investigation data/reports were available for review during this PA.

5.0 SOURCE CHARACTERIZATION

Based on limited available information, it is difficult to fully characterize the source(s) present at the site. When the facility was active, the site manufactured heavy armor and miscellaneous alloy steel castings. The majority of the contamination is thought to be present at the main manufacturing/plant building area. In addition to the main manufacturing/plant building, there are four areas within the site that are suspected to be source areas; they are the Former Oil Tank Farm area, the Waste Treatment Plant area, and the Laboratory area (Building 20) (Figure 2). However, contamination can be assumed to be present in areas outside the four delineated areas (AHE, 1983; USATHMA, 1979).

Further investigation of the site may result in identification of contamination at areas other than those previously discussed. Inspection of the former lumber storage yard, machine shop, boiler houses, fuel tanks, and sewage plants in the former Utilities Area may identify other potential sources with commonly associated hazardous constituents such as waste oils and PCBs (AHE, 1983 and USATHMA, 1979). Furthermore, because no samples have been collected for the analysis of munition-related constituents (e.g., sulfur, lead, molybdenum disulfide, zinc phosphate and tri-and hexavalent chromates) it can not be determined whether the site is currently contaminated with those wastes. Inspection of the heat treating furnace areas, Building 32, and several shot blast scale removal machine areas may identify other sources for munition-related hazardous constituents.

6.0 PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT

6.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

St. Louis County lies at the southern extent of the Kansan Glaciation, with just a few areas of soil classified as glacial in origin. Most of the surface formations in St. Louis County consists of extensive deposits of windblown silt (loess) derived from the flood plain of the Missouri River during the Pleistocene (glacial) Period. The deepest loess, some more than 45 feet thick, is found along the bluffs of the Missouri River. In general these deposits narrow to the south and are seldom more than seven to nine feet thick along the ridgetops in the southwestern part of the county (USDA, 1982; USATHMA, 1979).

The bedrock geology in St. Louis County consists of essentially flat-lying sedimentary formations (primarily limestone and dolomite). A slight regional northeast dip has been modified by several minor northwest-southeast trending folds or flexures. A soil test boring drilled in 1971 at the nearby St. Louis Army Ammunition Plant found medium hard, light gray, medium- to fine-grained limestone at around 60 feet below ground surface (bgs); this is the Ste. Genevieve Limestone of the Mississippian System which was overlain by 39 feet of medium hard, light yellow to gray, sandy clayey, shale to shale from the Lower Pennsylvanian System (USATHMA, 1979).

The bedrock units present in and around St. Louis are capable of yielding varying amounts of water to wells. Yields of wells are dependent on such factors as depth, length, and diameter of the open hole; formations penetrated; geographic location; structural attitude of the rock; and permeability of the aquifers tapped. Most wells in the St. Louis Area yield a maximum of 189 liters per minute down to 932 feet bgs (USATHMA, 1979).

6.2 GROUNDWATER MIGRATION PATHWAY

Based on the USEPA Geographic Information Query System (GIQS) data, there are approximately 299,089 residents within a 4-mile radius of the site. Approximately 20,389 live within a one-mile radius of the site. According to GIQS results, no public water supply source is located within a 4-mile radius of the site. In addition, the City of St. Louis receives its water from surface water intakes on the Mississippi River. The residents in the site vicinity rely on the City of St. Louis public water supply system for drinking water. In addition, no private drinking water wells were identified during the PA. Further there are no known Well Head Protection Areas within four miles of the site (USEPA, 2001).

No groundwater samples have been collected at the site. Based on the operational history of the site, the potential for groundwater contamination is high. The extent of the groundwater contamination, if present, is currently unknown; however, if such contamination is present, there is a potential threat to nearby downgradient wells, if any. Although no registered groundwater wells were identified in the GIQS database, it is suspected that groundwater wells are present within a 4-mile radius of the site. A site reconnaissance will be necessary to rule out the possibility that wells are present within

a 4-mile radius of the site. Collection of groundwater samples onsite and in the nearby vicinity should be considered. However, the possibility that such contamination would impact groundwater targets is low, since all residences are reportedly connected to the St. Louis public water system.

6.3 SURFACE WATER MIGRATION PATHWAY

The River Des Peres dissects the site, and therefore, drainage from the site is suspected to enter the River Des Peres. However, no probable points of entry have been identified. From the site, the River Des Peres drainage travels south/southwest for approximately six miles and merge with the Mississippi River. From that point of confluence, the next nine miles of the Mississippi River represent the remainder of the 15-mile downstream surface water body target distance limit (TDL) (USFWS, 1993).

No known drinking water intakes are located along the 15-mile TDL; however, the Mississippi River is a surface water body that has state-designated, livestock watering, recreational body contact (for swimming and boating), drinking water, and industrial uses. In addition, the River Des Peres has livestock watering use. Both the Mississippi River and the River Des Peres are state-designated fisheries (MDNR, 1994). The American Bittern (*Botaurus lentiginosus*), Crystal Darter (*Crystallaria asprella*), Elephant-Ear (*Elliptio crassidens*), Ebonyshells (*Fusconaia ebena*), Pink Mucket (*Lampsilis abrupta*), Flathead Chub (*Platygobio gracilis*), Sheepnose (*plethobasus cyphyus*), Pallid Sturgeon (*Scaphirhynchus albus*), and Running Buffalo Clover (*Trifolium stoloniferum*) are state-classified threatened or endangered species in St. Louis (MDC, 2001). Further, several wetlands exist within the 15-mile TDL segment of the site, along the River Des Peres and the Missisippi River (Figure 4). Further investigations may identify additional environmental targets.

Table 1. Threatened and endangered species potentially occurring in or near the project area.

American Bittern	N/A	Endangered
Crystal Darter	N/A	Endangered
Ebonyshells	N/A	Endangered
Elephant-Ear	N/A	Endangered
Flathead Chub	N/A	Endangered
Pallid Sturgeon	Endangered	Endangered
Pink Mucket	Endangered	Endangered
Running Buffalo Clover	Endangered	Endangered
Sheepnose	N/A	Endangered

No sampling data is currently available to indicate whether surface water or sediment contamination is present due to past DoD activities onsite. However, the potential exists for any onsite contamination to be released into nearby surface water bodies during heavy rainfall events. Fishing and other recreational activities are known to occur within the 15-mile TDL of the site. Therefore, the threat of exposure may exist for human targets through food chain contamination. State-designated endangered species also occur in the site vicinity. Further investigation is necessary to fully characterize potential onsite surface water/sediment contamination.

6.4 SOIL EXPOSURE PATHWAY

The site is located within the industrial and residential area of the City of St. Louis and is covered primarily by buildings, roads, parking lots, and other man-made structures. GAAP is situated on the Urban land-Harvester-Fishpot Association. It consists of areas on uplands, terraces, and bottom lands. Limestone is present in some areas. Slopes range from zero to 20 percent (USDA, 1982).

The site currently includes an industrial park, a college campus, residences, and farms. The number of workers on-site is currently unknown. Several residences are located in the site vicinity; however,

the exact number of residents within 200 feet of the site is unknown. There are approximately 20,389 residents within a one-mile radius of the site and, based on USEPA GIQS data, approximately 299,089 people reside within a 4-mile radius of the site (USEPA, 2001). Because the facility provides restricted access to the public, the potential threat to nearby residents is moderate.

Because people work on the site, the threat posed to the worker population via the soil exposure pathway is considered moderate to high. Because no samples have been collected at the site, the extent and the characteristics of potential source area(s) is currently not fully defined. Additionally, no evidence is present to indicate whether site-derived contaminants may have migrated from the source area(s) to the residences. A thorough soil sampling effort would aid in delineating the source area(s) and the residences where contamination may to be located, if any. The threat via the air migration pathway is considered low.

7.0 SUMMARY AND CONCLUSIONS

The 1979 IA Report, by USATHMA found no evidence of on-site waste disposal present, and concluded that no contaminant migration potential existed as a result of past DoD operations. However, the IA recommended that an environmental survey be conducted to certify that the property was not contaminated. The 1982 Environmental Survey Report, by Environmental Science and Engineering, Inc., indicated the presence of oil leaks, leaking PCB transformers, and heavy metal-containing sludge. It should be noted that the 1982 survey limited its investigation to three acres (one parcel) of the site. Reportedly, no investigation has been conducted on the remaining twelve acres of land.

The site is potentially contaminated with various hazardous substances associated with past handling and disposal practices, and may contain additional sources yet to be identified. Further investigation of the site may result in identification of contamination at areas other than those previously discussed. An inspection of the former lumber storage yard, machine shop, boiler houses, fuel tanks, and sewage plants in the former Utilities Area may identify other sources and associated hazardous constituents such as waste oils and PCBs (AHE, 1983 and USATHMA, 1979). Furthermore, because no samples have been collected for the analysis of munition-related constituents (e.g., sulfur, lead, molybdenum

disulfide, zinc phosphate and tri-and hexavalent chromates) it can not be determined whether these constituents are present at the site. Inspection of the heat treating furnace areas, Building 32, and several shot blast scale removal machine areas may identify other potential sources for munition-related hazardous constituents.

The main migration pathways of concern for the site are the surface water pathway and soil exposure pathway. It should be noted that the threat of a release to groundwater also exists. The soil exposure pathway is of concern since workers use the facilities on or near suspected source areas, creating the potential for contact with contaminated soils. It should be noted that no sampling data is currently available to indicate whether soil, groundwater, surface water, or sediment contamination is present. However, the potential exists for any onsite soil contamination to be released to the surface water and groundwater migration pathways. The air migration pathway was not evaluated during previous investigations. Considering the types of contaminants identified in the soil, a release via the air migration pathway in unlikely. Sampling is needed to determine the nature and extent of contamination onsite.

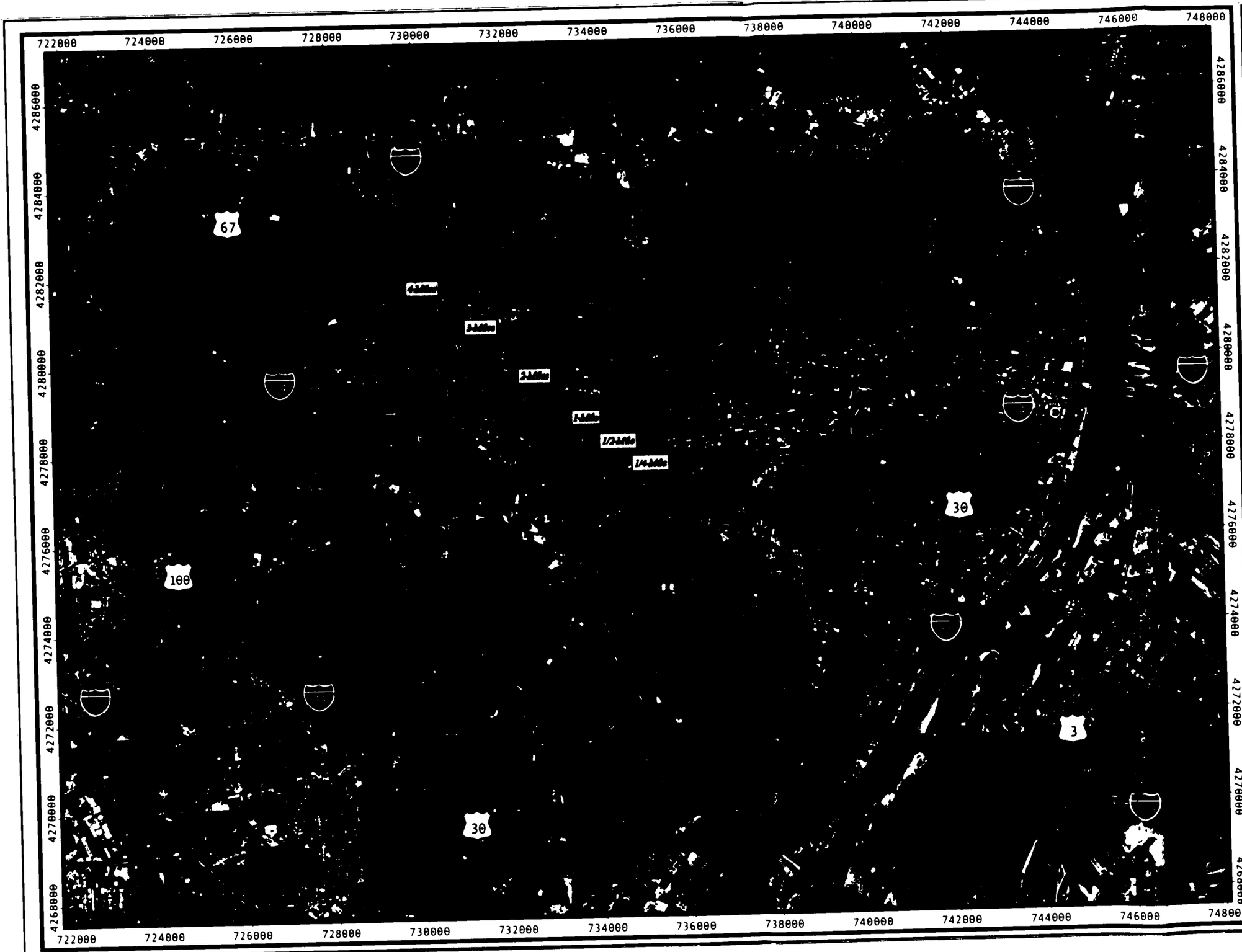

Figure 3
4-Mile Radius

Gateway (ex) Army Ammunition Plant
CERCLIS Number MO1210020813

N
W E
S

0.5 0 0.5 1 1.5 Miles

900 0 900 1800 Meters

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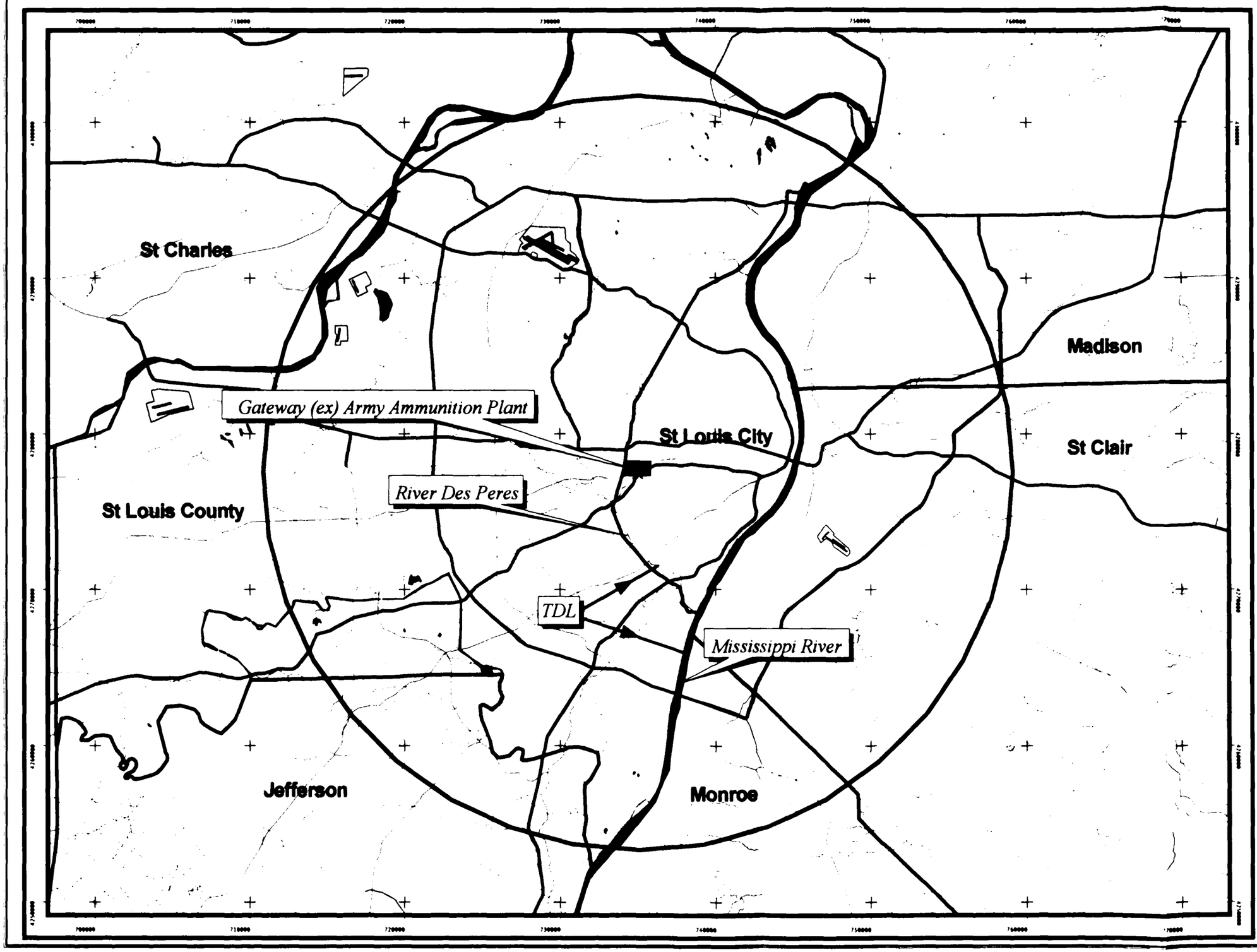
Figure 4
15-Mile
Target to Distance Limit
(TDL)

Gateway (ex) Army Ammunition Plant
CERCLIS Number MO1210020813



N
W E
S

TDL
15-Mile Target Distance Limit
Gateway (ex) Army Ammunition Plant
Roads
Primary road with limited access
Primary road
Railroads
Rivers
Airports
Airport
Runway
Water
Counties

2 0 2 4 Miles
3000 0 3000 6000 Meters

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8.0 REFERENCES

U.S. Army Toxic and Hazardous Materials Agency, (USATHMA), 1979, *Installation Assessment of Gateway Army Ammunition Plant, Report No. 152, St. Louis, Missouri,* December 1979.

U.S. Department of Agriculture, Soil Conservation Service (USDA), 1982, *Soil Survey of St. Louis County, Missouri*, Washington, D.C., April 1982.

A.H. Environment, Inc, (AHE), 1983, *Decontamination Operations at the Gateway Army Ammunition Plant,* Emerson, New Jersey, November, 1983.

U.S. Fish & Wildlife Service, (USFWS), 1993, National Wetland Inventory Map: Oakville, Missouri-Illinois, 1993.

Missouri Department of Environmental Quality, (MDNR), 1994, Chapter 7: Missouri Surface Water Quality Standards, Jefferson City, Missouri, February 7, 2000.

U.S. Environmental Protection Agency (USEPA), 2001, Geographic Information Query System, Web Page, http://www.epa.gov/region10/www//gisapps/natsite.html, Seattle, Washington, April 18, 2001.

Missouri Department of Conservation, (MDC), 2001, *Heritage Database: Results for St. Louis County, Missouri, Sensitive Environment,* http://www.em.doe.gov/er/define.html, April 19, 2001.

Appendix I

HRS Scoring Deficiency Checklist

HRS Scoring Deficiency Check List

Facility Name: Gateway (Ex) Army Ammunition Plant **Date Reviewed:** May 2001 **EPA ID#:** MO1210020813

Reviewed By:	Kumud Pyakuryal, TechLaw, Inc., Overland Park, Kansas		
Facility Name:	Gateway (Ex) Army Ammunition Plant	**City/State:**	St. Louis, Missouri

1. OVERVIEW/SITE HISTORY	**INFORMATION IS... (Check Box if YES)**			
	Provided	**Acceptable**	**Not Provided**	**Estimated By**
1A. Reports submitted to EPA are referenced and copies of each reference are provided.	✔			
1B. Describe facility operations (manufacturing, storage, waste disposal practices, etc.) including the following:		✔		
1B1. History of the facility and sources (any area containing or potentially containing hazardous substances).		✔		
1B2. A topographic map with a 4-mile radius drawn around each site.		✔		
1B3. A facility and source location map and sketch.		✔		
1B4. Regulatory history of the facility (e.g., RCRA facility, TSCA, CERCLA, NPDES permits, etc.).		✔		
1C. Describe any emergency response actions or interim remedial actions that have occurred at the facility. Description should include amount of material removed, disposal location, and sample analytical results prior and subsequent to removal.			✔	
1D. Describe any release of hazardous substances, pollutants, or contaminants to groundwater, surface water, soil or air and provide sampling with detection limits, laboratory methods, and quality assurance procedures.			✔	
1E. Give the following population within each radius indicated below. Each radius should begin at the center of each source if the source is small or at the outer edge if the source is large. Count population in overlapping areas only once.				
1E1. 0-¼ mile.				✔
1E2. ¼-½ mile				✔
1E3. ½-1 mile				✔
1E4. 1-2 miles				✔
1E5. 2-3 miles				✔
1E6. 3-4 miles				✔
1F. Describe any prior spill (e.g., quantity of the spill, hazardous substances) that occurred at the facility.				✔
1G. Describe facility and source security and access (e.g., fences, patrol gates, natural barriers, etc.).		✔		
2. WASTE/SOURCE INFORMATION (see Section 2 of the **HRS Final Rule,** ***Federal Register,*** December 1990).				
2A. Describe as specifically as possible the types of wastes produced at the facility and the methods in which these wastes were treated, stored, or disposed of (including location of disposal).				✔
2B. Describe as specifically as possible the amount (volume, weight, etc.) of each waste type produced and the form in which it was discharged or disposed (e.g., solid, liquid, gas, etc.) at the facility.				✔

HRS Scoring Deficiency Check List

Facility Name: Gateway (Ex) Army Ammunition Plant **Date Reviewed:** May 2001 **EPA ID#:** MO1210020813

	Provided	Acceptable	Not Provided	Estimated By
2C. Describe each source type (e.g., landfill, surface impoundment, etc.) located within the facility boundary.				✔
2D. Describe as specifically as possible the constituents (concentrations of individual constituents) of each waste type disposed in each source.				✔
2E. Describe as specifically as possible the amount of waste treated, stored, or disposed of in each source (e.g., landfills, impoundments, tanks).				✔
2F. Determine the depth at which wastes were deposited in each source.			✔	
2G. Describe as specifically as possible the condition/integrity of each source (e.g., do landfills have liners or caps?).				✔
2H. Describe any secondary containment features/structures associated with each source (e.g., precipitation run-on and runoff systems, leachate collection systems, gas collection systems, etc.).				✔
2I. Determine the size, volume, capacity, and area of each source.				✔
3. GROUNDWATER PATHWAY INFORMATION (see Section 3 of the **HRS Final Rule,** ***Federal Register,*** December 1990).				
3A. Determine if the groundwater within a 4-mile radius of each source is used for any of the following purposes and locate the wells on a map. Each radius should begin at the center of each source if the source is small or at the outer edge if the source is large. Provide the depth of each well.				✔
3A1. Private or public drinking-water source.			✔	
3A2. Irrigation of commercial food or commercial forage crops (include acres).				✔
3A3. Commercial livestock watering.			✔	
3A4. Water of major or designated recreational area, excluding-drinking water use.			✔	
3A5. Standby wells used for drinking water at least once a year.			✔	
3B. Outline the public water distribution system within a 4-mile radius of each source.			✔	
3C. Identify the nearest drinking water well within a 4-mile radius of each source.				
3D. Determine the population (including workers, students, and residents) drawing from each drinking-water well within the following radii. Each radius should begin at the center of each source if the source is small or at the outer edge if the source is large. Count overlapping population only once.				
3D1. 0-¼ mile.				✔
3D2. ¼-½ mile				✔
3D3. ½-1 mile				✔
3D4. 1-2 miles				✔

HRS Scoring Deficiency Check List

Facility Name: Gateway (Ex) Army Ammunition Plant **Date Reviewed:** May 2001 **EPA ID#:** MO1210020813

	Provided	Acceptable	Not Provided	Estimated By
3D5. 2-3 miles				✔
3D6. 3-4 miles				✔
3E. Describe known or probable groundwater flow direction from each source.		✔		
3F. Describe as specifically as possible the geology and hydrogeology of the facility area (including geological formation names, thickness, types of material, hydraulic conductivities, and depth to aquifers); provide references.		✔		
3G. Discuss any evidence of aquitards and discontinuities between aquifers within a 4-mile radius of each source.			✔	
3H. Discuss any evidence of interconnections between the uppermost aquifer and the lower aquifer within 2 miles of each source.			✔	
3I. Estimate annual net precipitation at the facility.		✔		
3J. Discuss soil or geologic conditions that might inhibit or facilitate groundwater migration.		✔		
3K. Determine if sources are located in an area of Karst terrain.				✔
3L. Provide results from groundwater sampling of aquifers underlying the sources and from domestic wells (drinking water) with 2 miles of each source.			✔	
3M. Provide results from background groundwater sampling of aquifers underlying the sources.				✔
3N. Determine if any areas within a 4-mile radius of each source are located in a Wellhead Production Area according to Section 1428 of the Safe Drinking Water Act.			✔	
4. **SURFACE WATER PATHWAY INFORMATION** (see Section 4 of the **HRS Final Rule,** ***Federal Register,*** December 1990).				
4A. Describe surface water bodies 0 to 15 miles downstream of each source and provide a map of surface water bodies receiving drainage from each source.		✔		
4B. Discuss the probable surface runoff pattern from each source to surface waters, including the distance to the nearest surface water body; provide a map.				✔
4C. Describe the point(s) at each source where hazardous substances begin to migrate and their probable point(s) of entry into a surface water body (including ponds, lakes, streams, etc.).			✔	
4D. Identify if surface water drawn from intakes with 15 miles downstream of the probable point of entry is used for any of the following purposes:				✔
4D1. Irrigation (5-acre minimum) of commercial food or commercial forage crops.				✔
4D2. Watering of commercial livestock.			✔	
4D3. Ingredient in commercial food preparation.			✔	

HRS Scoring Deficiency Check List

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4D4. Major of designated water recreation area, excluding drinking water.		✔		
4E. Identify the following targets associated with surface water bodies 0 to 15 miles downstream of the probable point of entry:				
4E1. Population (residents, workers, and students) served by surface water intakes of drinking water.				✔
4E2. Sensitive environments (see Table 4-23, of the **HRS Final Rule, *Federal Register,*** December 1990) and critical habitats for federally endangered or threatened species.		✔		
4E3. Economically important resources (e.g., shellfish).				✔
4E4. Any portion of the surface water designated by a state for drinking water use under Section 305(a) of the Clean Water Act; or any portion of surface water usable for drinking water.				✔
4F. Determine the miles of wetland (wetland frontage) along surface water bodies 0 to 15 miles downstream form the probable point of entry (see 40 CFR section 230.3).			✔	
4G. Provide results from sampling of wetlands and/or sensitive environments 0 to 15 miles downstream of each source.			✔	
4H. Discuss any qualitative, quantitative, or circumstantial evidence of contamination of surface waters from source.		✔		
4I. Provide results from sediment and surface water sampling for points 0 to 15 miles downstream of each source.			✔	
4J. Provide results from background sediment and surface water sampling.			✔	
4K. Provide results from sampling of surface water intakes 0 to 15 miles downstream of each source.			✔	
4L. Estimate the size of the upgradient drainage area for each source.			✔	
4M. Determine the 2-year, 24-hour rainfall for the site.				✔
4N. Discuss the average annual streamflow associated with each surface water body located 0 to 15 miles downstream of each source.				✔
4O. Determine surface solid types at the facility.			✔	
4P. Determine if sources are located in a 1-year, 10-year, 100-year, or 500-year flood plain.			✔	
4Q. Discuss fisheries (recreational or commercial) in surface water bodies 0 to 15 miles downstream of each source.		✔		
4Q1. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of streams and rivers 0 to 15 miles downstream of each source.			✔	

HRS Scoring Deficiency Check List

Facility Name: Gateway (Ex) Army Ammunition Plant **Date Reviewed:** May 2001 **EPA ID#:** MO1210020813

	Provided	Acceptable	Not Provided	Estimated By
4Q2. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of ponds, lakes, bays, or oceans 0 to 15 miles downstream of each source.			✔	
4R. Identify closed fisheries 0 to 15 miles downstream of each source.			✔	
4S. Provide results from sampling of human food chain organism tissures in streams and rivers 0 to 15 miles downstream of each source and in ponds, lakes, or bays that receive drainage from the sources.			✔	
5. AIR PATHWAY INFORMATION (see Section 4 of the **HRS Final Rule,** ***Federal Register,*** December 1990).				
5A. Describe if there has been an observed release (e.g., visual or analytical evidence) of a hazardous substance to the atmosphere.			✔	
5B. Determine the shortest distance to the closest residence or regularly occupied building or area from any on-site source.		✔		
5C. Determine if any of the following resources are located with a 1/2-mile radius of each source:				
5C1. Commercial agriculture.			✔	
5C2. Commercial silviculture.			✔	
5C3. Major or designated recreation area.			✔	
5D. Determine if sensitive environments are within 4-mile radius of each source.			✔	
5E. Determine the total area of wetlands within a 4-mile radius of each source.			✔	
6. SOIL EXPOSURE PATHWAY INFORMATION (see Section 4 of the **HRS Final Rule,** ***Federal Register,*** December 1990).				
6A. Describe any areas of contamination that are within 2 feet of the ground surface; provide the areal extent of contamination.				✔
6B. Provide locations and depths of soil samples and results.			✔	
6C. Provide results of background soil sampling.			✔	
6D. Identify locations of the closest residence, school, or daycare within 200 feet of each source; provide population of each.			✔	
Additional Comments: Because the information available for the PA lacked sampling results, it is difficult to accurately characterize the waste and identify the HRS specific targets associated with the sources on site. Extensive sampling and data collection activities are necessary to fully characterize the extent of contamination onsite. Further investigation is necessary to fully characterize the threats associated with the sources scattered around the former depot.				

NOTE: Where information is provided but not acceptable, discuss briefly, why the information is not acceptable.

HRS Scoring Deficiency Check List

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